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Tropical Cyclone Intensity Changes

Christopher S. Velden
Cooperative Institute for Meteorological Satellite Studies,
University of Wisconsin-Madison
1225 W. Dayton Street
Madison, WI 53706
phone: (608) 262-9168 fax: (608) 272-5974 email: Chris.Velden@ssec.wisc.edu
Grant Award Number: N00014-99-1-0509
http://www.ssec.wisc.edu

LONG-TERM GOALS

My long-term goal is to better determine the relationship between observed environmental wind shear and TC intensity change in order to improve prediction.

OBJECTIVES

The primary objectives are to better understand the relationship between vertical shear and TC intensity using observations, and develop methods to quantitatively analyze the shear using high-resolution satellite data.

APPROACH

Our approach is to collect a large, multi-basin database matching TCs with coincident environmental shear fields developed at UW-CIMSS. These analyses incorporate the most advanced satellite wind observations. We plan to conduct a thorough investigation and statistical analysis of the tendencies in the shear vs. TC intensity. We will examine other parameters in this relationship such as latitude, storm size and potential intensity. From the statistical analysis, we hope to derive a formula or statistically based shear model that can be used by JTWC and/or naval operational forecasters. Chris Velden, PI and Gregg Gallina, an MS student are involved in this project.

WORK COMPLETED

The database for the Atlantic and East Pacific basins has been assembled. Work is beginning on the West Pacific.

RESULTS

Since this effort is only 5 months old, there are no quantitative, conclusive results as of yet.

IMPACT/APPLICATIONS

Applications of this research will be a quantitative TC intensity forecast method for JTWC/naval forecasters to utilize as objective guidance.

TRANSITIONS

Real-time fields of vertical wind shear and tendency are already being disseminated from CIMSS to JTWC for qualitative use and evaluation. The objective model will be delivered next year after the statistical analysis is completed.

RELATED PROJECTS

The UW-CIMSS shear fields are going to be tested for impact in the operational SHIPS model, which is an intensity prediction scheme developed by Mark DeMaria of NESDIS. Collaboration with DeMaria is underway.

REFERENCES

Pasch, R.J., and C.S.Velden, 1999: Operational use of UWISC/CIMSS vertical wind shear fields for TC forecasting at the TPC/NHC. Abstracts of the 23rd AMS Conf. On Hurricanes, Dallas, TX, 571-574.